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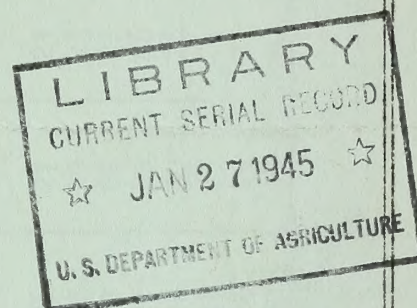
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SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for the

COLORADO RIVER DRAINAGE BASIN

March 1, 1944



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Issued by the  
United States Department of Agriculture  
Soil Conservation Service  
Division of Irrigation  
In Cooperation with  
The Colorado Agricultural Experiment Station  
Colorado State College  
Fort Collins, Colorado

March 10, 1944







# SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

## COLORADO RIVER BASIN

March 1, 1944

The following data pertaining to snow surveys and irrigation water-supply forecasts are provided by the Division of Irrigation, Soil Conservation Service, U. S. Department of Agriculture, in cooperation with State departments, other federal bureaus and local organizations. The snow measurements are made principally by field personnel of the following Federal Government organizations: Forest Service, National Park Service, Geological Survey, Bureau of Reclamation, Indian Service; and the Utah Agricultural Experiment Station. This work is otherwise conducted cooperatively with the State Engineers of Wyoming, Utah, and Colorado, U. S. Geological Survey, Utah and Colorado Agricultural Experiment Stations, and various municipalities, irrigation associations, power companies, and others. Precipitation records are supplied by the U. S. Weather Bureau.

SUMMARY OF MARCH 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS  
BY WATERSHEDS

WATERSHEDS	Snow Depth			Water Content			Number Courses in Average	Snow Density			1944 Water Content in percent of	
	Nine year Avg.*	1943	1944	Nine year Avg.*	1943	1944		Nine year Avg.*	1943	1944	Nine year Avg.*	1943
	In.	In.	In.	In.	In.	In.		Percent	Percent	Percent		
COLORADO RIVER												
Colorado River**	39.8	44.9	28.3	10.2	12.0	6.8	20	26	27	23	67	57
Yampa River	49.3	56.3	36.3	13.8	16.2	8.4	4	28	29	23	61	52
White River	45.8	45.2	37.4	13.7	12.7	10.1	2	30	28	27	74	80
Gunnison River	47.6	47.2	44.5	13.0	13.1	11.7	10	27	28	26	90	89
Dolores River	38.1	35.8	36.2	9.8	10.6	9.6	4	26	30	26	98	90
San Juan River	44.2	39.4	50.6	13.0	13.1	14.6	7	29	33	29	112	111
Gila River	8.6	1.4	11.1	2.4	0.4	3.0	9	28	29	27	125	750
Green	37.9	55.0	27.2	10.7	18.5	5.5	4	28	34	20	51	30

\*Some for shorter periods

\*\*Above Grand Junction, Colo.



# P R E C I P I T A T I O N   D A T A

WATERSHED	STATE	Precipitation October 1 to February 29	Departure from Normal	Precipitation February	Departure from Normal
		Inches	Inches	Inches	Inches
Colorado	Colorado	6.02	-1.45	1.35	-0.48
Green	Wyoming	4.51	+0.38	0.99	+ .12
San Juan	New Mexico	3.90	-0.28	0.94	+ .01
Gila	Arizona	7.00*	+0.49*	3.24*	+1.69*
Gila	New Mexico	2.41	-1.89	.57	-0.32

\*February precipitation estimated.

On the watershed of the Colorado and its tributaries in Colorado, February precipitation was below normal and the accumulated precipitation since October 1 was 1.45 inches below normal. February precipitation on the watershed of the Green in Wyoming, San Juan in New Mexico and Gila in Arizona was above normal, and on the Gila the excess was 1.69 inches. The accumulated precipitation was also above normal except on the San Juan in New Mexico. On the Gila watershed in New Mexico both the February precipitation and the accumulated precipitation were below normal.

## WATER SUPPLY OUTLOOK

COLORADO RIVER AND TRIBUTARIES IN COLORADO: Recent surveys over the headwaters of the Colorado River and its main tributaries above Grand Junction show the water content of the snow to be slightly more than one half the amount measured last year at this time, and only 67 percent of the past 9-year average. The same situation is found on the Yampa drainage. On the White conditions are better. The present cover is 80 percent of last year and 74 percent of the average. For the Gunnison the water content is 89 percent of that a year ago and is 90 percent of the 9-year average. The snow on Grand Mesa is decidedly better than it was a year ago. At Trickle Divide last year the water content was 19 inches and at present it is 24. At Park Reservoir last year it was 17.6 inches and now it is 22.4. The storage in Taylor Park Reservoir is now 85,000 acre-feet which is 32 percent more than it was a year ago. This reservoir is expected to fill to capacity before the irrigation season starts. The Green Mountain Reservoir, on the Blue River south of Kremmling, stores 56,500 acre-feet or about 40 percent capacity. The outlook for filling the many small reservoirs and lakes on Grand Mesa is at this time favorable. Soil moisture over the irrigated sections of these drainage areas is poor to fair, and stream flow about normal. Some melting is occurring at the lower elevations, causing the streams to be roily but melting is not sufficient to increase the stream flow materially.



SAN JUAN AND DOLORES RIVER: The present water content of the snow on the San Juan drainage is 11 percent, more than a year ago and 12 percent above the average. On the west side of Wolf Creek Pass the average depth of snow on the snow course was  $8\frac{1}{2}$  feet, containing 30 inches of water. Conditions on the Dolores drainage have improved during the past month and the snow cover is now 90 percent of last year and equal to the 9-year average. The outlook for the coming season for the Dolores and San Juan drainages is now promising. Reservoir storage is normal for this time of year with prospects of substantial accumulations during the spring runoff. Vallecito Reservoir has about 29,000 acre-feet in storage which is 60 percent of that a year ago. The soil moisture is generally good and the streamflow normal or better.

GREEN RIVER: The present snow cover on this drainage in western Wyoming is very light, being approximately 30 percent of last year and only 51 percent of the past 9-year average. Soil moisture generally in this section of the State is fair to good. Stream flow is below normal.

GILA AND SALT RIVER: The present snow cover over the headwaters of these streams is very materially improved over that of a year ago. The March 1st surveys show the average water content of the snow on these drainages to be 3 inches as compared with 0.4 inch last year. At McNary the depth averaged 24.5 inches and contained 7.1 inches of water. This is the greatest snow cover in this area since March 1, 1939 when the depth was 27.3 inches and water content 7.5 inches.

Reservoir storage in both the Salt and Gila drainages has been increased following the general storms occurring during the last few days of February. Since the first of February the total accumulation in the principal reservoirs on the Salt was 62,000 acre-feet which brought the combined storage to 1,111,000 acre-feet, which is about 85 percent of that of last year and about 60 percent of full capacity. Last year at this time San Carlos Reservoir on the Gila held 534,000 acre-feet as compared with 280,000 now. This reservoir accumulated a small amount of water during the recent storm period. Carl Pleasant Reservoir on the Agua Fria rose from 2,700 to 14,700 acre-feet. Since March first additional storms have improved the storage outlook, particularly for the Salt River Valley. Soil moisture in the Phoenix area is very good and stream flow much above normal, the discharge of the Salt River being 1,400 second-feet, the Verde 2,000 second-feet and Tonto Creek 1,300 second-feet. On the Verde watershed the snow cover on the mountains above 8,000 feet is about 4 feet deep, containing a large percentage of water. For the Springerville area rainfall has been subnormal, soil moisture fair to good and stream flow normal. The recent surveys in the Alpine district show a decided increase in the water content of the snow as compared with the February 15th observations.

The present outlook for western Colorado, as based on the recent snow surveys, is not encouraging. For the San Juan and Dolores areas the prospects are somewhat brighter. Recent storms over the Gila and Salt River areas have materially added to the reservoir storage, particularly on the Salt River drainage. The runoff in the Agua Fria and Verde rivers has been very productive in the accumulation of reservoir storage. Generally in Arizona, the water supply outlook for the coming season is good at this time.



## COLORADO RIVER WATERSHED

Summary of Federal and State Cooperative Snow Surveys  
Issued March 10, 1944, at Fort Collins, Colo.

Main Drainage and		Local Drainage	State	Location		Elev.	National Forest	Mar. 1 Snow Cover Measurements					
No.	Snow Course			Locality	Description			Av. Snow Depth	Av. Water Content	Av. @ 1943	Av. @ 1944	In.	In.
COLORADO RIVER													
(Above Grand Junction)													
7	Park View*	Willow Cr.	Colo.	7mi. SE. Rand	24-5N-78W	9200	Routt	30.3	31.2	24.6	7.3	6.5	4.7
12	Phantom Valley	Colorado R.	"	11mi. N. Grand L.	7-5N-75W	9300	Ry. Mtn. N.P.	31.6	40.4	18.2	8.2	9.3	3.6
16	Berthoud Pass	Fraser R.	"	4mi. S. West Port.	35-2S-75W	9700	Arapaho	48.2	51.3	34.6	12.5	13.7	8.2
19	Tennessee Pass*	Eagle River	"	Tennessee Pass	21-8S-80W	10200	Cochetopa	31.8	33.9	20.5	7.5	8.2	4.1
33	Ind. Pass Tunnel	Lincoln Gulch	"	W. Port. Tunnel	30-11S-82W	10200	Holy Cross	46.6	53.0	34.2	13.3	16.0	9.9
34	N. Lost Trail Cr.	Crystal R.	"	3mi. E. Marble	20-11S-87W	9200	"	44.6	37.4	35.3	10.0	8.8	9.6
37	M. Fork Camp Cr.	Williams Fk.	"	13mi. N. Dillon	16-3S-77W	9000	Arapaho	32.8	37.5	23.6	8.0	10.2	4.3
44	Fiddler Gulch	Eagle River	"	2mi. E. Mitchell	1-8S-80W	11000	Holy Cross	45.3	47.4	33.4	11.7	15.3	8.0
45	Nast	Frying Pan R.	"	23mi. SE. Basalt	1-9S-83W	8700	"	23.5	24.2	15.0	5.7	5.7	3.0
56	Mesa Lakes	Mesa Creek	"	15mi. E. Palisade	35-11S-96W	10000	Grand Mesa	49.4	34.7	46.2	13.6	8.6	12.0
59	Lulu	Lulu Creek	"	14mi. N. Grand L.	25-6N-76W	10200	Ry. Mtn. N.P.	--	59.0	--	--	13.8	--
62	Willow Creek P.	Willow Cr.	"	Willow Cr. Pass	1-4N-78W	9500	Arapaho	35.8	38.4	29.0	8.8	8.8	5.9
64	N. Inlet Grand L.	N. Inlet Cr.	"	4mi. NE. Grand L.	26-4N-75W	9000	Ry. Mtn. N.P.	28.9	39.7	16.6	6.8	9.6	3.2
65	Lake Irene	Beaver Creek	"	1mi. SW. Milner P.	8-5N-75W	10600	"	55.0	71.4	40.4	15.2	21.1	6.8
66	Thunderbolt Peak	Buchanan Cr.	"	5mi. E. Monarch L.	22-2N-74W	9500	Arapaho	46.7	49.5	41.6	11.8	13.0	11.4
69	Arrow	S. Ranch Cr.	"	Arrow	34-1S-75W	9900	"	31.7	39.7	24.6	7.5	8.1	6.1
70	Lapland	St. Louis Cr.	"	7mi. SW. Fraser	16-2S-76W	9300	"	34.7	51.2	25.7	8.3	13.4	5.5
79	Fremont Pass #2	Blue River	"	Fremont Pass	2-8S-79W	11400	"	47.7	55.8	31.0	12.0	15.3	7.4
91	Lynx Pass No. 2	Rock Cr.	"	7mi. NE. Toponas	27-2N-83W	9100	Routt	40.6	46.5	28.5	10.6	12.5	5.8
96	Shrine Pass	Blue River	"	Shrine Pass	15-6S-79W	10500	Arapaho	48.3	59.1	35.0	12.3	16.5	8.2
97	Grizzly Peak	"	"	1mi. W. Loveland P.	2-5S-76W	11250	"	43.4	56.2	28.7	13.0	19.9	7.4
				Average for Drainage				39.8	44.9	29.3	10.2	12.0	6.8
YAMPA RIVER													
6	Dry Lake	Soda Creek	Colo.	4mi. NE. Steam. Spgs	26-7N-84W	8200	Routt	52.0	59.6	37.6	15.0	18.4	10.0
8	Columbine Lodge*	Harrison Cr.	"	Rbt. Ears Pass	21-5N-82W	9300	"	60.9	70.0	40.9	17.4	20.0	9.5
9	Elk River	Independence Cr.	"	Columbine	6-10N-85W	8700	"	43.8	49.0	38.3	12.1	14.1	8.3
91	Lynx Pass No. 2*	Morrison Cr.	"	7mi. NE. Toponas	27-2N-83W	9100	"	40.6	46.5	28.5	10.6	12.5	5.8
				Average for Drainage				49.3	56.3	36.3	13.8	16.2	8.4
WHITE RIVER													
75	Burro Mountain	N. Elk Creek	Colo.	8mi. S. Buford	15-2S-91W	9000	White River	50.7	42.5	44.9	15.0	11.4	11.4
76	Rio Blanco	White River	"	4mi. NW. Trappers L	28-1N-88W	8500	"	41.0	48.0	29.8	12.4	14.0	8.8
				Average for period of record.				45.8	45.2	37.4	13.7	12.7	10.1
*On adjacent drainage. @Average for period of record.													

\*On adjacent drainage. @Average for period of record.



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			Locality	Description			Av. Snow Depth	Snow Depth	Av. Water Content	Content
							1943	1944	1943	1944
In.							In.	In.	In.	In.
<b>GUNNISON RIVER</b>										
18 Crested Butte	Slate River	Colo.	3mi. N. Crested B.	22-13S-86W	9000	Gunnison	46.0	55.2	33.2	12.0
42 Marshall Creek	Marshall Cr.	"	Marshall Pass	24-48N-6E	10800	Cochetopa	40.8	41.8	31.8	10.1
43 Poncha Creek*	"	"	"	19-48N-7E	10500	"	30.8	35.5	23.5	8.3
46 Park Cone	Taylor River	"	Taylor Park Res.	19-14S-82W	9700	Gunnison	32.4	34.8	23.8	7.3
53 Alexander Lake	Kiser Creek	"	10mi. N. Cedaredge	2-12S-95W	10000	Grand Mesa	64.4	54.5	69.5	17.9
55 Snowshoe Mesa	Snowshoe Cr.	"	16mi. NE. Paonia	14-13S-89W	7500	Gunnison	32.4	31.7	27.5	8.5
58 Fronton Park	Red Mtn. Cr.	"	5mi. S. Ouray	29-43N-7W	9500	Uncompahgre	39.4	33.9	32.0	11.7
85 Frickle Divide	Surface Cr.	"	13mi. N. Cedaredge	23-11S-94W	10000	Grand Mesa	73.5	69.3	83.1	21.2
87 Park Reservoir	"	"	11mi. N. Cedaredge	34-11S-94W	9500	"	68.6	63.3	79.2	20.1
89 Porphyry Creek	Porphyry Cr.	"	Monarch Pass	19-49N-6E	10300	Cochetopa	47.3	51.6	41.8	12.7
94 Sunshine Mt. No. 2	Henson Cr.	"	10mi. W. Lake City	35-44N-6W	10200	Gunnison	37.1	--	30.7	9.9
				Average for Drainage			47.6	47.2	44.5	13.0
<b>DOLORES RIVER</b>										
23 Rico	Dolores R.	Colo.	2mi. S. Rico	11-39N-11W	8700	Montezuma	31.3	31.4	32.7	8.2
24 Telluride	San Miguel R.	"	Telluride	6-42N-8W	8600	"	30.2	26.8	24.2	7.3
25 Lizard Head	Dolores R.	"	10mi. N. Rico	24-41N-10W	10300	"	50.7	48.9	49.7	13.1
90 Lone Cone	Ground Hog Cr.	"	16mi. N. W. Rico	23-41N-13W	8900	"	40.2	36.1	38.1	10.6
				Average for Drainage			38.1	35.3	36.2	9.8
<b>SAN JUAN RIVER</b>										
26 Wolf Creek Pass*	Wolf Creek	Colo.	Wolf Creek Pass	4-37N-2E	10000	Rio Grande	76.1	72.5	90.4	23.3
29 Upper San Juan	"	"	4mi. W. Wolf Cr. P.	10-37N-1E	10000	San Juan	85.1	78.7	101.5	25.1
30 Silverton Sub. S.	Animas R.	"	2mi. NE. Silverton	10-41N-7W	9400	"	23.9	17.2	23.9	5.4
31 Cascade	Cascade Cr.	"	5mi. N. Electra L.	12-39N-9W	8850	"	36.4	29.6	42.8	9.8
93 Granite Peaks	Los Finos R.	"	11mi. NE. Columbus	24-37N-6W	7950	San Juan	28.8	28.3	34.7	10.9
17 Chama Divide*	Amargo R.	N. Mex.	6mi. W. Chama	36.9N106.7W	7750	Off Forest	21.7	18.3	23.7	6.2
18 Chamita*	Navejo R.	"	6mi. NW. Chama	36.9N106.7W	8500	"	37.7	31.2	37.1	10.2
				Average for Drainage			44.2	39.4	50.6	13.0

\*On adjacent drainage

Average for period of record



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No.	Snow Course			Locality					Av. Snow Depth	Av. Water Content	1943	1944	1943	1944
							In.	In.	In.	In.	In.	In.		
GILA RIVER														
11	Frisco Divide	Blue River	N. Mex.	6mi. S. Luna	31-6S-20W	8000	Apache	8.5	2.9	10.1	2.3	2.4		
14	State Line	" "	" "	Alpine/Luna	6-6S-21W	8000	"	11.2	2.1	11.8	2.7	2.8		
22	Taylor Creek	Taylor Creek	" "	2mi. NE. Inmans	20-10S-10W	7850	Gila	1.5	0.0	0.0	0.2	0.0		
3	Nutrioso	San Fran. R.	Ariz.	5mi. SE. Nutrioso	23-6N-30E	8500	Apache	8.4	2.0	5.5	2.4	1.7		
4	Beaver Head	Castle Cr.	" "	11mi. SW. Alpine	13-4N-30E	8000	"	12.0	3.3	6.5	3.6	1.6		
5	Coronado Trail	Colman Cr.	" "	4mi. S. "	26-5N-30E	8000	"	13.1	2.7	8.7	4.1	2.6		
6	McNary	Salt River	" "	3mi. NW. McNary	14-8N-23E	7200	W.M. Ind. Res.	11.6	0.0	24.4	3.3	7.1		
7	Forest Dale	" "	" "	5mi. SW. Showlow	2-9N-21E	6000	" "	5.3	0.0	14.4	1.5	4.6		
9	Milk Ranch	" "	" "	4mi. W. McNary	28-8N-23E	7000	" "	5.8	0.0	18.8	1.3	4.2		
							8.6	1.4	11.1	2.4	0.4	3.0		
							Average for Drainage							
GREEN RIVER														
23	Dutch Joe	Dutch Joe Cr.	Wyo	12mi. N. Elkhorn	33-31N-104W	8700	Wyoming	--	40.1	--	--	--		
24	Mulligan Park	Surveyor Cr.	" "	Fremont Lake	17-35N-108W	8900	"	35.9	50.2	25.1	8.5	4.7		
25	Kendall R.S.	Green River	" "	27mi. NW. Pinedale	23-38N-110W	7900	"	32.2	53.0	20.5	11.7	4.3		
26	Loomis Park	Beaver Cr.	" "	28mi. " "	14-37N-111W	8500	"	46.9	66.1	36.0	13.2	7.4		
44	E. Rim Divide	Fish Cr.	" "	13mi. SE. Bondurant	32-37N-111W	7950	Teton	36.6	50.9	27.0	9.5	5.7		
							37.9	55.0	27.2	10.7	18.5	5.5		
							Average for Drainage							

Average for period of record